Missions for America
Semper vigilans!
Semper volans!

The Coastwatcher

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SCHEDULE OF COMING EVENT

07 OCT-TRCS Meeting
14 OCT-TRCS Meeting
17-19 OCT-CTWG/NER Conference
16-18 OCT-NER AEO Course at Conference
21 OCT-TRCS Meeting
18-25 OCT-NER Staff College-New Jersey
28 OCT-TRCS Meeting

08-09 NOV-SLS Course-Meriden

CADET MEETING NOTES

30 September, 2014
by
C/MSgt Virginia Poe

As this was the fifth Tuesday of the month, the evening was devoted to sports, flag football, and a film, *The Guardian*, about U.S. Coast Guard rescue swimmers.

SENIOR MEETING NOTES

30 September, 2014

Maj Farley led a discussion about our perceptions of the Subordinate Unit Inspection last week. All the participating departments reported that the inspection followed the agenda which had been issued in a pre-briefing with few exceptions. The professionalism of the CTWG inspection team was noted.

AEROSPACE CURRENT EVENTS

Air France Pilot Strike

The viability of Air France has been threatened by a two week pilots' strike protesting the lower salary scale planned for Transavia, the Air France-KLM low cost carrier (LCC).

Air France Boeing 747-400

Competition from European LCC such as the highly successful Ryanair and EasyJet have cut deeply into the profits of the legacy airlines. Air France management share part of the blame because of their lack of foresight and initiative in recognizing the threat posed by the LCC.

AEROSPACE HISTORY

X Planes
Part I

Bell X-1 Series

Most people have some knowledge of the Bell X-1 and Chuck Yeager's first flight through the “sonic barrier/” Few know that there were modified versions of the X-1 which contributed to the science of high speed flight.

Air is a fluid and the resistance of a fluid to motion is not linear. That is, doubling the speed of an object does not double the drag on that object. Rather, the drag increases radically. As a simple example, consider walking through calf-deep water and trying to run through it. Since water has a much greater density than air, the effect is noticed a very low speeds.

As aircraft speeds increased, the drag increased far out of proportion to the speed and the power plant's ability to provide enough thrust. Furthermore, serious aerodynamic problems occurred in the trans-sonic range and these had to be overcome.

The Army Air Force contracted with Bell Aircraft of Buffalo, N.Y, to build three airplanes to explore the region of trans-sonic and supersonic flight. These had straight, thin wings, rocket engines, and the shape of a .50 caliber bullet, a form know to be stable at supersonic speeds. They were carried aloft and launched was from a B-29 bomber.

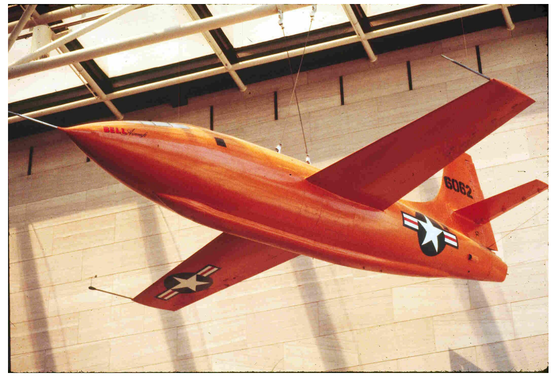
The National Aeronautics Committee on Aeronautics (NACA) was brought on board to develop instrumentation and provide data analysis services.

Reaction Motors provided the XLR-11, a four chambered rocket which could provide up to 6,000 lb of thrust using liquid oxygen and alcohol.

Initial glide tests were carried out by Jack Woolams at Pinecastle AAF Base in Florida. The aircraft was then flown at Muroc Dry Lake in California. Jack Woolams had been killed while preparing a modified Bell P-39 Airacobra for a race. He was replaced by Chalmers "Slick" Goodlin.

A second X-1 with a thicker wing section was also available by now and a two pronged research program was launched by the AAF and NACA.

Capt Chuck Yeager was chosen to make the first supersonic flight. NACA test pilot Herbert Hoover was the second man to go supersonic when he took the second X-1 to Mach 1.1.



Glamorous Glennis, the first of the X-1 hangs in state at the National Air & Space Museum on the Mall in Washington.

A third X-1 was outfitted with an improved fuel system by NACA with plans to strike for Mach 2. During testing, a fuel tank explosion destroyed the aircraft and its B-50 mothership.

Improved aircraft followed. The X-1A established a new altitude record before suffering a fate similar to the second X-1. It blew up in flight, destroying not only itself but the B-50 carrying it.

Bell X-1A in flight (Credit: USAF)

The X-1B was used primarily for thermal tests but also had reaction motors installed to test their ability to control flight attitudes.

X-1B at the Museum of the USAF

The X-1C reached the mock-up stage before the project was cancelled.

The X-1D, like the X-1B, was also used to study thermal distributions on the airframe, wings, and empennage. On its first glide test, the nose gear collapsed during the touchdown. Repairs were made but on its first attempt at a powered flight, it was jettisoned from the mothership and destroyed.

Rear quarter photo of X-1D clearly shows the four chambered rocket motor.

The X-1E was the second X-1, rebuilt for thermal studies. By then, the engineers had figured out that the explosions which had plagued the X-1 program was caused by gasket failure in the fuel lines. Modifications were carried out and the X-1E reached Mach 2.21 before retirement.

X-1E at Ames Research Center, Moffett Field

Bell X-2 Starbuster

Bell built two swept wing X-2 aircraft for exploration of the effects of thermal heating on structure and stability and control effectiveness at high speeds and altitudes. The engine was a Curtiss-Wright XLR25 which could be throttled up to 15,000 lb of thrust. A unique escape system was developed in which the nose section could be jettisoned and descend to a lower altitude while stabilized by a drogue chute at which point the pilot could bail out normally.

The first test pilot was "Skip" Zeigler, a veteran of the X-1 program. After a series of glide tests, the engine was installed at the Bell factory. During tests of the fuel system, an explosion occurred while the X-2 was aboard the B-50 mothership and Ziegler and a B-50 crewman were killed. The aircraft was jettisoned and lost in Lake Ontario. Lt. Col "Pete" Everest assumed the duties of chief test pilot.

X-2 on approach with nose wheel and landing skid deployed. (Credit:USA)

Everest took the X-2 through a series of partial power tests and eventually, in July of 1956, reached Mach 2.87 at 68,000 feet earning for himself the sobriquet of "the fastest man alive."

Capt Iven Kincheloe received an X-2 checkout and exceeded 126,000 feet as the Air Force sought more records. NACA requested transfer of the X-2 to their research program but the Air Force checked out Milburn Apt as a second pilot. In September of 1957, Apt became the first pilot to exceed Mach 3. However, a phenomenon known as inertial coupling caused the X-2 to become uncontrollable. Apt used the escape capsule but was unable to perform the normal bailout and was killed.

Douglas X-3 Stiletto

The X-3 was designed for a normal take-off and landing and cruise at Mach 2. The experimental goals were tests of low aspect wings and the use of titanium in the structure.

The initial flights were conducted by Douglas pilot Bill Bridgeman and the results were disappointing. Two Westinghouse J-34 turbojets were used when the chosen engines proved inadequate during testing by the manufacturer. As a result, the aircraft was underpowered and a turkey when its flight performance was evaluated. It needed 260 knots to lift off and could barely exceed Mach one in a dive. Lt.Col, Pete Everest, Maj. Chuck Yeager and NACA's Joe Walker were checked out and the program continued.

The X-3's was valuable in that its long fuselage and short wings resembled that of the then current crop of fighter aircraft such as the F-100 which were exhibiting signs of longitudinal instability.

The X-3 in the USAF Museum Annex.

In October of 1954, Walker lost control of the X-3 during tests involving abrupt turns and experienced the “roll coupling” in which the turn caused an uncommanded turn in the yaw and pitch axes. Walker flew the X-3 through a regime in which he experience a range of g loads from +7 to -7 but recovered control.

Never meeting its design goal of high speed flight, the single X-3 nevertheless provided value data on roll coupling, titanium structures, and tires for high speed ground runs.

Northrop X-4 Bantam

Northrop constructed a pair of X-4s. Supersonic shock waves developed by the wings interacted with horizontal tail surfaces and caused a loss of stability so the X-4 was designed with no horizontal tail. This was similar to the rocket powered Messerschmitt 163 Komet and the DeHavilland DH.108 Swallow.

The X-4's wing adjustment mechanism was mounted internally.

A large number of test pilots evaluated the X-4 and NACA's Walt Williams declared it a “lemon.” One of the two aircraft was retired and became a “hangar queen” which provided spare parts for its brother. In a five year career, between 1948 and 1953, just over 100 flights were made. The aircraft showed that a semi-tailless configuration was a non-starter at that time and that particular feature had to wait for the development of computer governed flight control systems such as that used in the F-117.

Bell X-5 Bantam

Bell returned to the X-plane game with its X-5 designed to test the feasibility of variable sweep wings. This feature allowed slower take-off and landing speeds and a higher cruise The X-5 wings could vary from 20° to 60° in about 20 seconds. A manual reversion was provided in case electrical power failed.. As an experimental aircraft, the X-5 could test a wide range of sweep angles.

The X-5 was based on the Messerschmitt P.1011, an aircraft whose wing angles could be changed on the ground but which never flew. The sole prototype was shipped to the Bell factory and served as a design resource for the X-5.

The X-5 displays its wing mounted control surfaces.

Skip Ziegler made the first flight in June of 1951 and Joe Walker, Pete Everest, and Scott Crossfield were but three of the many pilots checked out to fly the X-5. Crossfield noted that the low slung engine led to trim problems at different power settings and the aircraft was difficult to get out of a spin. Walker once required 18,000 ft to recover. One of the aircraft was lost after an unrecoverable spin.

A mass of useful data was collected during the four year run of the X-5 program. Engineers were able to redesign wing sweep mechanisms for more simplicity. The efficacy of variable wing sweep was demonstrated and the stability of an aircraft over a range of wing sweep angles was studied. Both the currently flown B-1B and the retired F-14 Tomcat and the F-111 Aardvark have taken advantage of variable sweep wings.

Ryan X-13 Vertijet

The USAF contracted with Ryan Aircraft to build a plane which could explore the possibilities of vertical take-off and landing (VTOL). Two were built and it first flew in May of 1956.

A Rolls-Royce Avon jet engine provided 10,000 lb of thrust which was capable of lifting the aircraft vertically at its 7,200 lb maximum take-off weight and it successfully demonstrated vertical take-offs, transition to level flight, and vertical landings.

The landing was accomplished by engaging a hook on the nose of the aircraft with a bar mounted on a vertical stand.

The Vertijet in launch position on its special trailer.

This concludes Part I of of a series on manned X planes. Unmanned test vehicles and cancelled projects have been omitted.